WHAT IS CLAIMED IS:

1. A heating apparatus comprising a heating element selected from the group consisting of conductive polyaniline fiber, conductive polyaniline yarn comprising conductive polymer fiber, fabrics comprising conductive polyaniline fiber or conductive polyaniline yarn, and non-conductive substrates supporting conductive polyaniline fiber or conductive polymer yarn; and means for passing a voltage or a current through said heating element.
2. The heating apparatus as described in claim 1, wherein said fabrics are selected from the group consisting of woven, knitted, stitched and braided fabrics.
3. The heating apparatus as described in claim 1, wherein said conductive polyaniline fiber comprises at least one dopant such that said conductive polyaniline fiber is characterized by an as-spun conductivity of $\geq$ 100 S/cm, said conductive polyaniline fiber having a chosen diameter.
4. The heating apparatus as described in claim 3, wherein the conductivity of said conductive polyaniline fiber is substantially destroyed at temperatures lower than the temperature at which said conductive polyaniline fiber loses said at least one dopant, or the temperature at which said at least one dopant decomposes, when a voltage or current greater than a voltage or current characteristic of the conductive polyaniline fiber is applied thereto.
5. The heating apparatus as described in claim 4, wherein structural integrity of said conductive polyaniline fiber is not significantly affected when the conductivity thereof is substantially destroyed as a result of the voltage or current characteristic of said conductive polyaniline fiber being applied thereto.
6. The heating apparatus as described in claim 4, wherein the temperature at which the conductivity of said conductive polyaniline fiber is substantially destroyed is determined by selecting the diameter of said conductive polyaniline fiber.

7. The heating apparatus as described in claim 4, wherein the temperature at which the conductivity of said conductive polyaniline fiber is substantially destroyed is determined by selecting said at least one dopant.
8. The heating apparatus as described in claim 3, wherein maximum power generated by a chosen length of said conductive polyaniline fiber is determined by selecting the diameter of said conductive polyaniline fiber.
9. The heating apparatus as described in claim 3, wherein maximum power generated by a chosen length of said conductive polyaniline fiber is determined by selecting said at least one dopant.
10. The heating apparatus as described in claim 3, wherein said at least one dopant is ion exchanged with a selected dopant.
11. The heating apparatus as described above in claim 3, wherein said conductive polyaniline fiber is dedoped to remove said at least one dopant, and redoped with a selected dopant.
12. The heating apparatus as described in claim 1, wherein said heating element is generated from substantially non-conductive polyaniline fiber or yarn comprising substantially non-conductive polyaniline fiber, after which said heating element is doped with at least one dopant such that the substantially non-conductive polyaniline fiber is comprised of at least one dopant and said conductive polyaniline fiber is characterized by a conductivity of $\geq$ 100 S/cm.
13. A conductive polyaniline fiber comprising at least one dopant and characterized by an as-spun conductivity of $\geq$ 100 S/cm, an as-spun peak stress $\geq$ 75 MPa, and a chosen diameter.
14. The conductive polyaniline fiber as described in claim 13, wherein said fiber is further characterized by an as-spun modulus $\geq$ 1 GPa, and an as-spun percent extension at fracture $\geq$ 10.
15. The conductive polyaniline fiber as described in claim 13, wherein said fiber is generated from a solution comprising polyaniline, 2-acrylamido-2-methyl-1-propanesulfonic acid, dichloroacetic acid, and water.

16. The conductive polyaniline fiber as described in claim 15, wherein said fiber is spun using polyaniline having a molecular weight of ≥ 200,000 g/mol.

17. The conductive polyaniline fiber as described in claim 15, wherein said solution is caused to coagulate by contacting said solution with a liquid selected from the group consisting of ethyl acetate and 2-butanone.

18. The conductive polyaniline fiber as described in claim 17, wherein said fiber is placed in contact with phosphoric acid solution after being placed in contact with said liquid.

19. The heating apparatus as described in claim 15, wherein said 2-acrylamido-2-methyl-1-propanesulfonic acid is ion exchanged with a selected dopant.

20. The heating apparatus as described above in claim 15, wherein said conductive polyaniline fiber is dedoped to remove said 2-acrylamido-2-methyl-1-propanesulfonic acid, and redoped with a selected dopant.

21. The conductive polyaniline fiber as described in claim 13, wherein the conductivity of said conductive polyaniline fiber is substantially destroyed at less than the temperature at which said conductive polyaniline fiber loses said at least one dopant, or the temperature at which said at least one dopant molecule is destroyed, when a voltage or current greater than a voltage or current characteristic of the fiber is applied thereto.

22. The conductive polyaniline fiber as described in claim 21, wherein structural integrity of said fiber is not significantly affected when the conductivity thereof is substantially destroyed subsequent to the voltage or current characteristic of said fiber being applied thereto.

23. The conductive polyaniline fiber as described in claim 21, wherein the temperature at which the conductivity of said conductive polyaniline fiber is substantially destroyed is determined by selecting said at least one dopant.

24. The conductive polyaniline fiber as described in claim 21, wherein the temperature at which the conductivity of said conductive polyaniline fiber is substantially destroyed is determined by selecting the diameter of said conductive polyaniline fiber.

25. The conductive polyaniline fiber as described in claim 21, wherein maximum power generated by a chosen length of said conductive polyaniline fiber is determined by selecting the diameter of said conductive polyaniline fiber.

26. The conductive polymer fiber as described in claim 21, wherein maximum power generated by a chosen length of said conductive polyaniline fiber is determined by selecting said at least one dopant.

27. A heating apparatus comprising in combination a conductive polyaniline fiber having at least one dopant and a chosen diameter, and characterized by an as spun conductivity of ≥ 100 S/cm and an as-spun peak stress of ≥ 75 MPa; and means for applying a voltage or a current to said fiber.

28. The heating apparatus as described in claim 27, wherein said conductive polyaniline fiber is further characterized by an as-spun modulus ≥ 1 GPa and an as-spun percent extension at fracture ≥ 10.

29. The heating apparatus as described in claim 27, wherein said fiber is generated from a solution comprising polyaniline, 2-acrylamido-2-methyl-1-propanesulfonic acid, dichloroacetic acid, and water.

30. The heating apparatus as described in claim 29, wherein said fiber is spun using polyaniline having a molecular weight of ≥ 200,000 g/mol.

31. The heating apparatus as described in claim 29, wherein said solution is caused to coagulate by placing said fiber in contact with a liquid selected from the group consisting of ethyl acetate and 2-butanone.

32. The heating apparatus as described in claim 30, wherein said fiber is placed in contact with phosphoric acid solution after being placed in contact with said liquid.

33. The heating apparatus as described in claim 29, wherein said 2-acrylamido-2-methyl-1-propanesulfonic acid is ion exchanged with a selected dopant.

34. The heating apparatus as described above in claim 29, wherein said conductive polyaniline fiber is dedoped to remove said 2-acrylamido-2-methyl-1-propanesulfonic acid, and redoped with a selected dopant.

35. The heating apparatus as described in claim 27, wherein the conductivity of said conductive polyaniline fiber is substantially destroyed at less than the temperature at which said conductive polyaniline fiber loses said at least one dopant, or less than the temperature at which said at least one dopant is destroyed, when a voltage or current greater than a voltage or current characteristic of the fiber is applied thereto by said means for applying a voltage or a current to said fiber.

36. The heating apparatus as described in claim 35, wherein structural integrity of said fiber is not significantly affected when the conductivity thereof is substantially destroyed subsequent to the voltage or current characteristic of said fiber being applied thereto.

37. The heating apparatus as described in claim 35, wherein the temperature at which the conductivity of said conductive polyaniline fiber is substantially destroyed is determined by selecting said at least one dopant.

38. The heating apparatus as described in claim 35, wherein the temperature at which the conductivity of said conductive polyaniline fiber is substantially destroyed is determined by selecting the diameter of said conductive polyaniline fiber.

39. The heating apparatus as described in claim 27, wherein maximum power generated by a chosen length of said conductive polyaniline fiber is determined by selecting the diameter of said conductive polyaniline fiber.

40. The heating apparatus as described in claim 27, wherein maximum power generated by a chosen length of said conductive polyaniline fiber is determined by selecting said at least one dopant.